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ABSTRACT

The pattern of correct and incorrect responses on the Slosson Intelligence Test (SIT) can be used by teachers to estimate the student's strengths and weaknesses. A scheme for classifying the items was developed to aid teachers and other professionals interested in conducting an informal item analysis with the SIT so it could be added to other diagnostic information. The eight categories for items on the SIT include: (1) arithmetic; (2) vocabulary; (3) numerical memory; (4) word memory; (5) comparison; (6) general knowledge; (7) motor skills; and (8) similarities and/or analogies. An example of how to implement the informal item analysis is provided. The goal of the informal item analysis will be achieved if it helps provide teachers with additional diagnostic insights so that instruction can be more responsive to students' needs. (Three tables of data are included.) (RS)

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Diagnostic Insights for At-risk Readers with the Slosson Intelligence Test

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Diagnostic Insights for At-risk Readers with the Slosson Intelligence Test

The Slosson Intelligence Test (Slosson, 1982) is generally recommended as a preliminary screening procedure for both children and adults. Teachers with no specialized training in individual testing can learn to administer this instrument quickly and accurately. Testing time will vary depending upon how quickly the basal age (ten consecutive correct responses before the first error occurs) and the ceiling level (ten consecutive errors) are reached. The scoring, for the most part, is objective and may be recorded by placing a plus (+) or minus (-) beside each question that is given to the student. Critical reviews of the Slosson Intelligence Test (SIT) may be found in Buros (1972) and Mitchell (1985).

Teachers and clinicians can learn more than the intelligence quotient when administering an individual intelligence test (Boyd, 1974). Over the years many classroom teachers, reading specialists, and learning disability teachers have used the SIT with their students. These teachers have often observed and noted many pertinent behaviors displayed by students taking the test. Some students, for example, respond quickly while others respond with deliberation. These same students may be quite verbal or give responses that are relitively short and direct.

In addition to noting these and other behaviors, teachers have noticed the relative ease with which students of the same

age answer certain types of questions. For example, the SIT contains numerous items which appear to measure the student's ability to define words. While Pam may define most of the words correctly, Peter may have considerable difficulty with the same items. It is quite possible, however, that Peter may be better than Pam in answering items which seem to measure arithmetic skills. Differences like these among students often stimulate teachers to hypothesize that students may have certain strengths and/or weaknesses in the various items on the SIT. Much of this thinking is done informally. McCormick (1987, p. 91) notes that teachers could examine the SIT for specific items missed. For example, if Marie had trouble with the meaning vocabulary items, instruction might be planned to foster a larger knowledge of word meanings. In addition, the teacher could encourage Marie to read widely.

Item Analysis Development

Ekwall and Shanker (1988, p. 281) note that the pattern of correct and incorrect responses in such areas as general knowledge and vocabulary can be used by teachers to estimate the student's strengths and weaknesses. Over several years a scheme for classifying the items was developed to aid teachers and other professionals interested in conducting an informal item analysis with the SIT so it could be added to other diagnostic information. With the assistance of numerous teachers and graduate students, the items from the SIT were classified into logical categories. Considerable discussion and debate accompanied the categories and the assignment of particular items to categories. The categories and items were reviewed and revised as various

versions were used with clients referred for diagnostic services at the Northern Illinois University Reading Clinic.

When the SIT item analysis was refined to the point where the items were being consistently assigned to the various categories, a reliability check was performed on the assignment of items to the proposed categories. Five teachers who had taken at least three reading courses were given the eight proposed categories (described below) and asked to independently assign each of the items to the most appropriate category. That meant that each teacher made 133 decisions or a total of 665 for the total group. Of these 665 decisions, there was agreement 630 times. This reliability check revealed almost 95 percent (actually 94.7%) agreement. The high level of agreement was considered to be strong evidence that the items could be consistently assigned to one of the eight categories.

Proposed Item Analysis

The informal item analysis was developed to help teachers gain insight into a student's possible strengths and weaknesses as hypothesized from the SIT. These tentative strengths and weaknesses might then be supported or refuted through other formal, informal, or diagnostic instruments. A thorough diagnosis is based on patterns among various tests (Bond, Tinker, Wasson, and Wasson, 1989, p. 95). The informal item analysis for the SIT, then, offers another bit of evidence to add to the other tests which may be administered to the student.

There are eight categories for the items on the SIT.

1. Arithmetic (A): the ability to mentally solve problems which progress from counting or memory to multistep, abstract, and quantitative reasoning. (Example: How many feet in 13 yards?)

2. Vocabulary (V): the ability to define words. (Example: What do we mean by infection?)

3. Numerical Memory (MN): immediate rote memory with numbers. (Example: Listen carefully and say these numbers just the way I say them: 8-5-1-9-2.)

4. Word Memory (MW): the ability to repeat meaningful English sentences. (Example: Say: "Goes fast." Now listen carefully and say exactly what I say: "The train goes fast on the tracks carrying people and bags of mail.")

5. Comparison (C): the ability to express similarities and differences among objects or concepts. (Example: What is the difference between latitude and longitude on a map?)

6. General Knowledge (G): information acquired from experience and education. (Example: How many months in a year?)

7. Motor Skills (M): the ability to draw common geometric forms from a model. (Example: Draw a block for me like this.)

8. Similarities and/or Analogies (S): the ability to verbalize relationships between objects or ideas. (Example: A carrot is a vegetable. An apple is a _____.)

The labels which describe the eight categories are words which should be easily understood by teachers and specialists. Since most teachers generally use the SIT with school-age students, the final item analysis began with item 3-5. To make the item analysis useful with older students, it was extended to

item 27-0. The resulting classification scheme for the SIT is presented in Table 1.

Insert Table 1 About Here

Preparing the Analysis Sheet from SIT Results

In using the informal item analysis, the following general guidelines are suggested:

1. All students do not necessarily have strengths and weaknesses. Be accurate and extremely cautious in conducting an item analysis.

2. Strengths and/or weaknesses should be considered tentative and confirmed or refuted with additional evidence.

3. Only items from the basal age through the first item missed on the ceiling should be used in the item analysis.

An example should help clarify how the proposed scheme might be used. Suppose Beth, a third grader with a chronological age of 8-5, has a basal age of 7-10 with items 13-10 being the first item on the ceiling that was missed. The items answered correctly (+) and incorrectly (-) from 7-10 to 13-10 are shown in Table 2.

Insert Table 2 About Here

A teacher could analyze Beth's responses by preparing a chart similar to that appearing in Table 3. Similar charts can be completed by following these steps.

Insert Table 3 About Here

1. Use Table 1 and put a + or - in the square next to each item the student answered. Remember to include only items from the basal age through the first item missed on the ceiling.

2. Tally the number of total items within each category and then record the number of items that are correct and wrong.

Professionals who have used the item analysis find it easiest to first complete the "All Items" columns. Fill in the "Basal Age Through CA (Chronological Age)" columns if they contain fewer items than the "Above CA" columns. Otherwise, fill in the "Above CA" columns next. Then use subtraction to complete the remaining columns. For example, the "Above CA" columns can be completed by subtracting the number of items in "Basal Age Through CA" from "All Items" for each of the categories in the item analysis. There will be some students whose basal age is greater than their chronological age. When this situation exists, ignore the "Basal Age Through CA" column.

3. Total the nine columns. The totals for "All Items" should equal the respective columns in "Basal Age Through CA" and "Above CA."

Using the Item Analysis

After the chart has been prepared, tentative strengths and weaknesses can be identified. The recommended procedure was refined over several years. Initially, the informal item analysis was based on total items within each of the eight categories. It

soon became clear that many students were classified as having weaknesses when most of the items missed were above their CA. The analysis was then supplemented with the "Basal Age Through CA" and "Above CA" columns.

In the "Basal Age Through CA" and "Above CA" columns, a tentative strength may be hypothesized if the student gets more than half of the items correct in a particular category. A tentative weakness in the "Basal Age Through CA" column would be hypothesized if the student misses more than half the items. Weaknesses are not hypothesized in the "Above CA" column.

By first considering the "All Items" category, the teacher might hypothesize that Beth has a weakness in arithmetic since she answered 10 of the 11 items incorrectly. Because all of the arithmetic items Beth answered were "Above CA," this hypothesis gains little support. In further analysis (See Table 2), the first arithmetic item for Beth is item 9-6 -- more than a year above her CA of 8-5. It is recommended, therefore, that no conclusions be drawn about strengths and weaknesses in arithmetic.

Vocabulary appears to be a strength. Beth correctly answered 6 of 9 vocabulary items above her CA. In fact, one of the vocabulary items (13-8) she got correct was over five years above her CA.

Numerical memory tentatively appears to be a weakness when the "All Items" columns are considered; however, since all of the items were above her CA, it would be wise not to make any conclusions regarding this area. A similar statement applies to comparisons. For general knowledge, Beth may have a tentative

strength because she answered all the questions in the "Basal Age Through CA" column; however, there are only two items upon which the hypothesis is based. This area definitely needs to be confirmed or refuted with additional evidence, especially since she did not exhibit a strength with the five general knowledge items above her CA.

Finally, word memory, motor skills, or similarities and/or analogies contain few or no items; therefore, no strengths or weaknesses are hypothesized. It is important that there be a sufficient amount of data upon which tentative strengths and weaknesses are identified. Based on an informal item analysis from Beth's performance on the SIT, the area of vocabulary might be a strength that could be assessed further with observation and other evaluative instruments. For example, if an informal reading inventory has been administered, there may be some vocabulary questions that could be considered along with the SIT data. Or, if a standardized vocabulary test is administered, her "reading vocabulary" from this test could be compared to her "oral ability to define words" on the SIT.

Some Things to Remember

Stewart and Jones (1976) note that the student's performance on the SIT could be used "to raise hypotheses about specific problem areas which could then be evaluated fully with the appropriate behavioral measures or observations" (p. 377). This is quite similar to the classroom teacher who informally categorizes a student's oral reading miscues from an informal reading inventory, makes tentative judgments about the student's strengths and weaknesses in word recognition, and then seeks to confirm or

refute the hypotheses through daily reading activities and other diagnostic data.

The concept of significance must underlie any judgments made. This concept was exemplified in analyzing Beth's performance. Tentative judgments were made after a careful comparison of the items correct and the items wrong in relation to the total number of items in a particular category as well as those items above her CA. Even when there appeared to be a trend indicating a strength or weakness, the decision was regarded as tentative and subject to further support from other relevant data. Teachers who undertake an informal item analysis should, therefore, regard the procedure as hypothesis making. When doubt arises as to the possible strengths and weaknesses hypothesized, other professionals who have had considerable experience with tests requiring clinical judgment should be consulted. Toward this end, school psychologists, learning disability teachers, and/or reading specialists might be called upon for assistance.

Remember that the item analysis is intended to be used informally. It should aid a teacher's judgment, not replace it. The determination of strengths and weaknesses is of no value unless it results in guides or hints for instructional strategies aimed at building upon strengths or eliminating weaknesses. The goal of the informal item analysis will be achieved if it helps provide teachers with additional diagnostic insights so that instruction can be more responsive to students' needs.

Professionals interested in an item analysis sheet may write the author. Please enclose a stamped, self-addressed envelope.

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Table 1

Informal Item Analysis for the Slosson Intelligence Test

Item	Category	Item	Category	Item	Category
		8-10	V	16-3	V
		9-0	V	16-6	V
		9-2	G	16-9	A
3-5	MW	9-4	V	17-0	V
3-6	C	9-6	A	17-3	V
3-7	G	9-8	V	17-6	V
3-8	G	9-10	A	17-9	V
3-9	A	10-0	A	18-0	V
3-10	G	10-2	G	18-3	MN
3-11	G	10-4	V	18-6	G
4-0	A	10-6	C	18-9	V
4-1	S	10-8	A	19-0	A
4-2	S	10-10	MN	19-3	G
4-3	G	11-0	C	19-6	V
4-4	S	11-2	V	19-9	A
4-5	MW	11-4	MN	20-0	V
4-6	S	11-6	V	20-3	A
4-7	G	11-8	G	20-6	V
4-8	MN	11-10	A	20-9	A
4-9	A	12-0	MN	21-0	S
4-10	MW	12-2	A	21-3	V
4-11	S	12-4	V	21-6	G
5-0	A	12-6	A	21-9	A
5-2	M	12-8	A	22-0	V
5-4	C	12-10	G	22-3	A
5-6	A	13-0	A	22-6	C
5-8	A	13-2	A	22-9	A
5-10	C	13-4	A	23-0	V
6-0	S	13-6	C	23-3	A
6-2	G	13-8	V	23-6	C
6-4	C	13-10	C	23-9	V
6-6	C	14-0	A	24-0	A
6-8	S	14-2	V	24-3	A
6-10	V	14-4	V	24-6	V
7-0	MN	14-6	A	24-9	V
7-2	G	14-8	V	25-0	V
7-4	M	14-10	A	25-3	V
7-6	A	15-0	V	25-6	V
7-8	C	15-2	G	25-9	G
7-10	G	15-4	V	26-0	V
8-0	MN	15-6	A	26-3	V
8-2	G	15-8	C	26-6	C
8-4	V	15-10	V	26-9	S
8-6	G	16-0	A	27-0	S
8-8	MW				

Table 2

Beth's performance on the Slosson Intelligence Test

Response	Item	Category	Response	Item	Category	Response	Item	Category
+	7-10	G	-	10-0	A	-	12-0	MN
-	8-0	MN	-	10-2	G	-	12-2	A
+	8-2	G	+	10-4	V	+	12-4	V
+	8-4	V	-	10-6	C	-	12-6	A
-	8-6	G	-	10-8	A	-	12-8	A
-	8-8	MW	-	10-10	MN	-	12-10	G
+	8-10	V	+	11-0	C	-	13-0	A
+	9-0	V	-	11-2	V	-	13-2	A
+	9-2	G	+	11-4	MN	-	13-4	A
-	9-4	V	-	11-6	V	-	13-6	C
-	9-6	A	-	11-8	G	+	13-8	V
+	9-8	V	+	11-10	A	-	13-10	C
-	9-10	A						

Table 3

Informal Item Analysis for Beth's Performance on the Slosson Intelligence Test

	All Items			Basal Age Through CA			Above CA		
	Total Items*	Items Correct	Items Wrong	Total Items	Items Correct	Items Wrong	Total Items	Items Correct	Items Wrong
1. Arithmetic (A)	11	1	10	0	0	0	11	1	10
2. Vocabulary (V)	10	7	3	1	1	0	9	6	3
3. Numerical Memory (MN)	4	1	3	0	0	0	4	1	3
4. Word Memory (MW)	1	0	1	1	0	1	0	0	0
5. Comparison (C)	4	1	3	0	0	0	4	1	3
6. General Knowledge (G)	7	3	4	2	2	0	5	1	4
7. Motor Skills (M)	-	-	-	-	-	-	-	-	-
8. Similarities and/or Analogies (S)	-	-	-	-	-	-	-	-	-
Totals	37	13	24	4	3	1	33	10	23

*Total items refers to only those items from the basal age through the first item missed on the ceiling.